

Abstract Of The Disclosure

A fiber-reinforced composite structure has two molded outer polymeric layers spaced apart from each other and defining a cavity therebetween. Each molded outer polymeric layer defines a sealing surface extending about a periphery of the respective layer, and the opposing sealing surfaces cooperate to define a hermetic seal extending about a periphery of the cavity. One or more multi-directional fiber reinforcement layers are adhesively attached in a discontinuous manner to each outer polymeric layer, and define a first region of the cavity extending between each respective outer polymeric layer and adjacent fiber reinforcement layer, and a second region of the cavity extending between the fiber reinforcement layers. A core is located between the two outer polymeric layers, and is made of a resinous core material capable of exhibiting a foamed character and a resinous character. The resinous core material has a blowing agent activatable upon exposure to a predetermined vacuum pressure within the cavity to convert the core material within the second region of the cavity from a resinous character to a foamed character and thereby fill the second region of the cavity with the foamed core material. Each multi-directional fiber reinforcement layer is impregnated with the core material exhibiting a relatively dense, resinous character, and each first region of the cavity is substantially filled with the core material exhibiting a resinous character to fixedly secure the multi-directional fiber reinforcement layers to the outer polymeric layers. A structural insert, such as a rigid plate adapted to receive fasteners, is embedded within the core material for attaching other devices or structures thereto.

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